



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,389	01/07/2002	Cheng-Yi Liu	2207/12660	3651

21186 7590 02/18/2004

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER

TRAN, MAI HUONG C

ART UNIT	PAPER NUMBER
----------	--------------

2818

DATE MAILED: 02/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

10/036,389

Applicant(s)

LIU ET AL.

Examiner

Mai-Huong Tran

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-27 and 29-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-27 and 29-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-27 and 29-44 are rejected under 35 U.S.C. 103 (a) as being unpatentable over U.S Patent No. 6,672,947 to Tsao et al. in view of Kutlu (6,472,762).

Regarding to claim 13, Tsao discloses a method of fabricating an integrated circuit package, comprising mounting a thinned semiconductor die 4 and a heat sink 12 may be required on top of the thinned die as set forth in col. 3 lines 55-60, col. 5, lines 1-3, lines 43-46, and fig. 2.

Tsao does not disclose mounting a thinned semiconductor die on a planar surface of a heat spreader.

However, Kutlu teaches mounting a thinned semiconductor die on a planar surface of a heat spreader as set forth in col. 3 lines 15-47 and fig. 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a thinned semiconductor die on a planar surface of a heat spreader in order to reduce or eliminate die cracks (col. 2, line 14).

Claim 14 is rejected under the same rationale set forth above to claim 13.

Claim 15 is rejected under the same rationale set forth above to claim 13.

Regarding to claim 16, the method wherein the die has a thickness of no more than 100 μm (col. 6, lines 61—64).

Claim 17 is rejected under the same rationale set forth above to claim 13.

Claim 18 is rejected under the same rationale set forth above to claim 13.

Claim 19 is rejected under the same rationale set forth above to claim 13.

Claim 20 is rejected under the same rationale set forth above to claim 13.

Claim 21 is rejected under the same rationale set forth above to claim 13.

Claim 22 is rejected under the same rationale set forth above to claim 13.

Claim 23 is rejected under the same rationale set forth above to claim 13.

Regarding to claim 24, Tsao discloses a method of fabricating an integrated circuit package, comprising providing a planar heat spreader 12 as set forth in col. 5, lines 40-46, and fig. 2;

However, Tsao does not disclose mounting a plurality of thinned semiconductor dice on to a planar surface of the heat spreader to form a plurality of conjoined

microelectronic packages; and singulating plurality of conjoined microelectronic packages.

Kutlu discloses mounting a plurality of thinned semiconductor dice on to a planar surface of the heat spreader to form a plurality of conjoined microelectronic packages; and singulating plurality of conjoined microelectronic packages as set forth in col. 3, lines 15-46, and fig. 2.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to mount a plurality of thinned semiconductor dice on to a planar surface of the heat spreader to form a plurality of conjoined microelectronic packages; and singulating plurality of conjoined microelectronic packages in order to reduce or eliminate die cracks (col. 2, line 14).

Claim 25 is rejected under the same rationale set forth above to claim 24.

Claim 26 is rejected under the same rationale set forth above to claim 24.

Claim 27 is rejected under the same rationale set forth above to claim 24.

Claim 29 is rejected under the same rationale set forth above to claim 24.

Claim 30 is rejected under the same rationale set forth above to claim 24.

Regarding to claim 31, Tsao discloses the method wherein the die has a thickness of no more than 100 μm (col. 3, lines 55-60).

Regarding to claim 32, Tsao discloses a method of fabricating an integrated circuit package, comprising mounting a thinned semiconductor die that has a thickness of no more than 100 μm as set forth in col. 3, lines 55-60.

However, Tsao does not teach the thinned semiconductor die on a planar surface of a heat spreader, and wherein mounting includes depositing a metallization layer on a back surface of the die.

Kutlu teaches a thinned semiconductor die on a planar surface of a heat spreader, and wherein mounting includes depositing a metallization layer on a back surface of the die.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form a thinned semiconductor die on a planar surface of a heat spreader, and wherein mounting includes depositing a metallization layer on a back surface of the die in order to reduce or eliminate die cracks (col. 2, line 14).

Claim 33 is rejected under the same rationale set forth above to claim 32.

Claim 34 is rejected under the same rationale set forth above to claim 32.

Claim 35 is rejected under the same rationale set forth above to claim 32.

Claim 36 is rejected under the same rationale set forth above to claim 32.

Claim 37 is rejected under the same rationale set forth above to claim 32.

Claim 38 is rejected under the same rationale set forth above to claim 32.

Claim 39 is rejected under the same rationale set forth above to claim 32.

Claim 40 is rejected under the same rationale set forth above to claim 32.

Claim 41 is rejected under the same rationale set forth above to claim 32.

Claim 42 is rejected under the same rationale set forth above to claim 32.


Claim 43 is rejected under the same rationale set forth above to claim 32.

Claim 44 is rejected under the same rationale set forth above to claim 32.


Conclusion

Any inquiry concerning this communication on earlier communications from the examiner should be directed to Mai-Huong Tran, (571) 272-1796. The examiner can normally be reached on Monday-Thursday from 8:00 AM to 6:30 PM. The examiner's supervisor, David Nelms can be reached on (571) 272-1787.

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.


Mai-Huong Tran

David Nelms
Supervisor, Examiner
Technology Center 2800


David Nelms
Supervisor, Patent Examiner
Technology Center 2800